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FAN7361, FAN7362

高侧栅极驱动器

特性

- 浮动通道专为高达 +600 V 的自举运行而设计
- 源 / 灌电流驱动能力典型值为 250 mA/500 mA
- 共模 dv/dt 噪声消除电路
- V_{CC} 和 V_{BS} 供电范围从 10 V 至 20 V
- V_{BS} 欠压锁定功能
- 输出信号与输入信号同相位
- 8-SOP

应用

- PDP 扫描驱动器
- 电机控制
- SMPS
- 电子镇流器

说明

FAN7361/FAN7362 是单片高侧栅极驱动 IC，可以驱动工作电压最高达 +600 V 的 MOSFET 和 IGBT。飞兆的高压工艺和共模噪声消除技术可使高侧驱动器在高 dv/dt 噪声环境下稳定运行。先进的电平转换电路能使高侧栅极驱动器的工作偏置电压达到 $V_S = -9.8 V$ ($V_{BS} = 15 V$ 时的典型值)。

UVLO 电路可防止 V_{BS} 低于指定的阈值电压时发生故障。输出驱动器通常提供 250 mA/500 mA 的源电流 / 灌电流，适合荧光灯镇流器、PDP 扫描驱动器和电机控制等。

8-SOP



订购信息

器件编号	封装	工作温度范围	Eco 状态	包装方法
FAN7361M ⁽¹⁾	8-SOP	-40°C ~ 125°C	RoHS	塑料管
FAN7361MX ⁽¹⁾				卷带和卷盘
FAN7362M ⁽¹⁾				塑料管
FAN7362MX ⁽¹⁾				卷带和卷盘

注:

1. 这些器件通过了 JESD22A-111 波峰焊测试。



对于飞兆公司的 Eco 状态定义，请访问：http://www.fairchildsemi.com/company/green/rohs_green.html。

典型应用电路

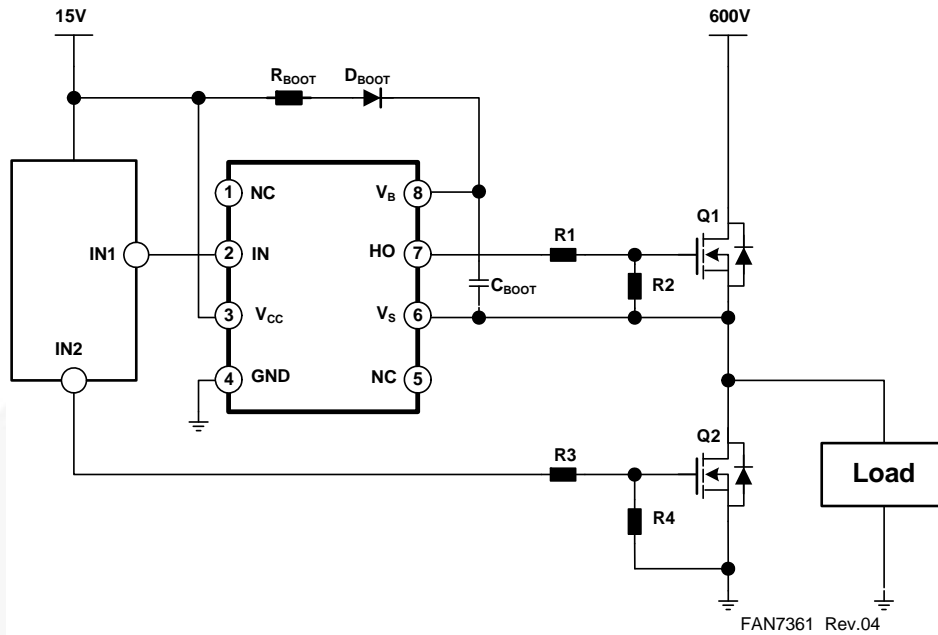


图 1. 典型应用电路

内部框图

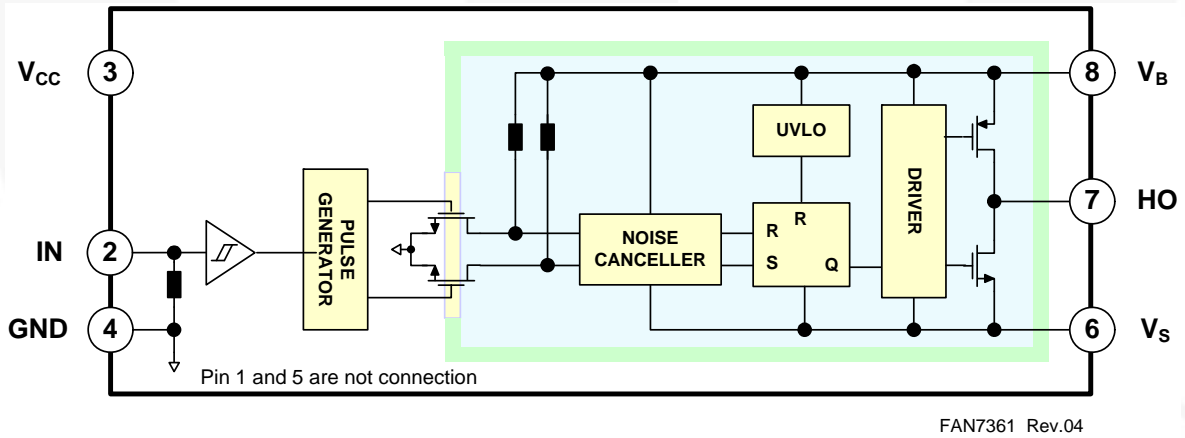
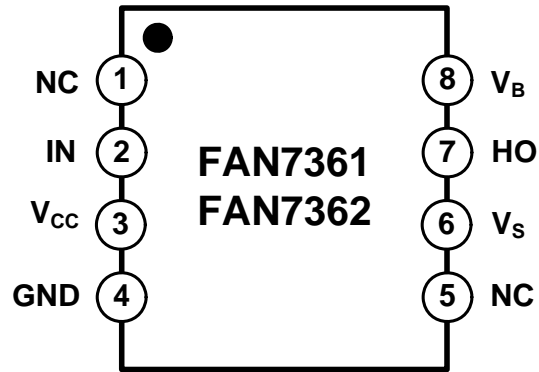


图 2. 功能框图

引脚配置



FAN7361 Rev.04

图 3. 引脚配置 (俯视图)

引脚定义

引脚	名称	功能 / 说明
1	NC	无连接
2	IN	高侧栅极驱动器输出的逻辑输入
3	V_{CC}	电源电压
4	GND	逻辑地
5	NC	无连接
6	V_S	高侧浮动电源电压返回
7	HO	高侧驱动输出
8	V_B	高侧浮动电源

绝对最大额定值

应力超过绝对最大额定值，可能会损坏器件。在超出推荐的工作条件的情况下，该器件可能无法正常工作，所以不建议让器件在这些条件下长期工作。此外，长期在高于推荐的工作条件下工作，会影响器件的可靠性。绝对最大额定值仅是应力规格值。除非另有说明， $T_A=25^{\circ}\text{C}$ 。

符号	特性	最小值	最大值	单位
V_S	高侧偏置电压	V_B-25	$V_B+0.3$	V
V_B	高侧浮动电源电压	-0.3	625	
V_{HO}	高侧浮动输出电压	$V_S-0.3$	$V_B+0.3$	
V_{CC}	固定逻辑电源电压	-0.3	25	
V_{IN}	逻辑输入电压	-0.3	$V_{CC}+0.3$	
dV_S/dt	允许的偏置电压变化速率		± 50	V/ns
$P_D^{(2)(3)(4)}$	功耗		0.625	W
θ_{JA}	结至环境热阻		200	$^{\circ}\text{C}/\text{W}$
T_J	结温		+150	$^{\circ}\text{C}$
T_S	存储温度		+150	$^{\circ}\text{C}$
T_A	环境温度	-40	+125	$^{\circ}\text{C}$

注意：

2. 安装到 76.2 x 114.3 x 1.6 mm PCB 板（FR-4 环氧玻璃材料）。
3. 参考以下标准：
 - JESD51-2: 集成电路热测试方法环境条件 - 自然对流
 - JESD51-3: 含铅表面贴装封装的低有效导热系数测试板
4. 在任何情况下，都不要超过 P_D 。

推荐工作条件

推荐的操作条件表明了器件的真实工作条件。指定推荐的工作条件，以确保器件的最佳性能达到数据表中的规格。飞兆半导体建议不要超过推荐工作条件，也不能按照绝对最大额定值进行设计。

符号	参数	最小值	最大值	单位
V_B	高侧浮动电源电压	V_S+10	V_S+20	V
V_S	高侧浮动电源偏置电压	$6-V_{CC}$	600	
V_{HO}	高侧输出电压	V_S	V_B	
V_{IN}	逻辑输入电压	GND	V_{CC}	
V_{CC}	逻辑电源电压	10	20	

电气特性

除非另有说明, $V_{BIAS}(V_{CC}, V_{BS})=15.0V$ 、 $T_A = 25^\circ C$ 。 V_{IN} 和 I_{IN} 参数以 GND 作为基准。 V_O 和 I_O 参数以 V_S 作为基准, 适用于相应的输出 HO。

符号	特性	测试条件		最小值	典型值	最大值	单位
V_{BSUV+}	V_{BS} 电源欠压正向阈值	$V_{BS}=$ 扫描	FAN7361	8.2	9.2	10.2	V
			FAN7362	7.6	8.6	9.6	
V_{BSUV-}	V_{BS} 电源欠压负向阈值	$V_{BS}=$ 扫描	FAN7361	7.4	8.6	9.2	
			FAN7362	7.2	8.2	9.2	
V_{BSHYS}	V_{BS} 电源欠压锁定滞回电压回差	$V_{BS}=$ 扫描	FAN7361		0.5		
			FAN7362		0.4		
I_{LK}	偏置电源漏电流	$V_B=V_S=600V$				10	μA
I_{QBS}	V_{BS} 静态电源电流	$V_{IN}=0V$ 或 $5V$			50	80	
I_{QCC}	V_{CC} 静态电源电流	$V_{IN}=0V$			30	75	
I_{PBS}	V_{BS} 工作电源电流	$C_L=1nF, f=10kHz$			420	550	
V_{IH}	逻辑“1”输入电压		FAN7361	3.6			V
			FAN7362	2.9			
V_{IL}	逻辑“0”输入电压		FAN7361			1.0	
			FAN7362			0.8	
V_{OH}	高电平输出电压, V_B-V_{HO}	无负载				0.1	
V_{OL}	低电平输出电压, V_{HO}	无负载				0.1	
I_{IN+}	逻辑“1”输入偏置电流	$V_{IN}=5V$			50	90	μA
I_{IN-}	逻辑“0”输入偏置电流	$V_{IN}=0V$			1.0	2.0	
I_{O+}	输出高电平短路脉冲电流	$V_{HO}=0V, V_{IN}=5V, PW \leq 10\mu s$		200	250		mA
I_{O-}	输出低电平短路脉冲电流	$V_{HO}=15V, V_{IN}=0V, PW \leq 10\mu s$		400	500		
V_S	IN 信号传播到 HO 时允许的 V_S 引脚负电压				-9.8	-7.0	V

动态电气特性

除非另有说明, $V_{BIAS}(V_{CC}, V_{BS})=15.0V$ 、 $V_S=GND$ 、 $C_L=1000pF$ 且 $T_A = 25^\circ C$ 。

符号	特性	测试条件	最小值	典型值	最大值	单位
t_{on}	导通传播延时	$V_S=0V$		120	200	ns
t_{off}	关断传播延时	$V_S=0V$ 或 $600V$		90	180	
t_r	导通上升时间			70	160	
t_f	关断下降时间			30	100	

注:

5. 参数由设计者提供。

典型特性

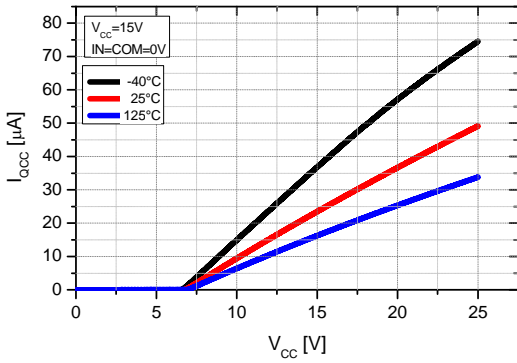


图 4. I_{QCC} 与电源电压的关系

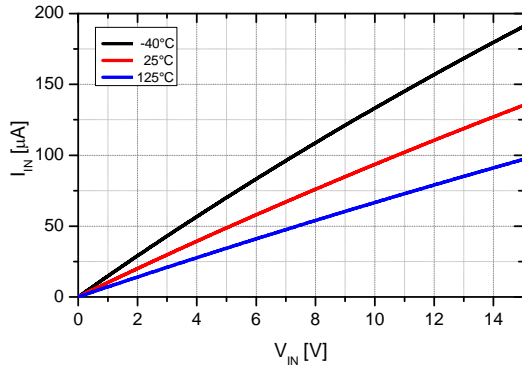


图 5. 输入偏置电流与输入电压的关系

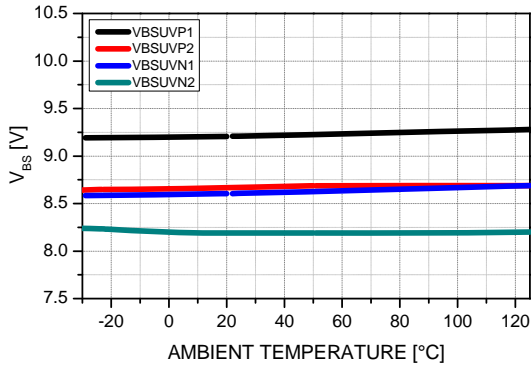


图 6. V_{BS} UVLO 与温度的关系

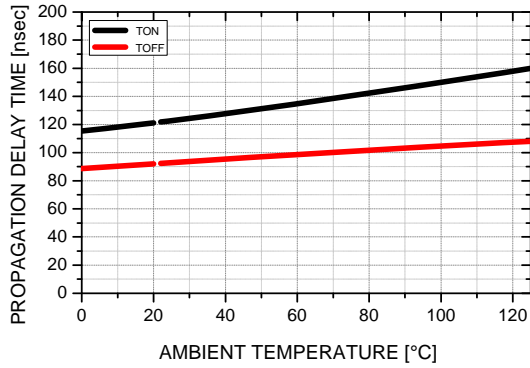


图 7. 导通 / 关断传播时间与温度的关系

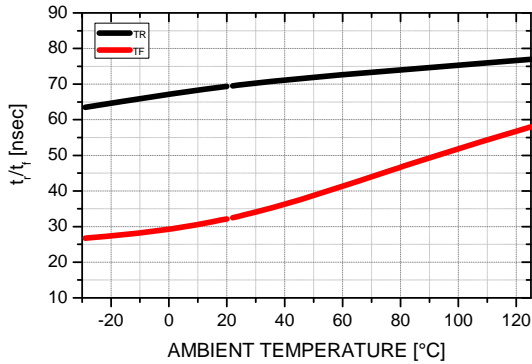


图 8. 上升 / 下降时间与温度的关系

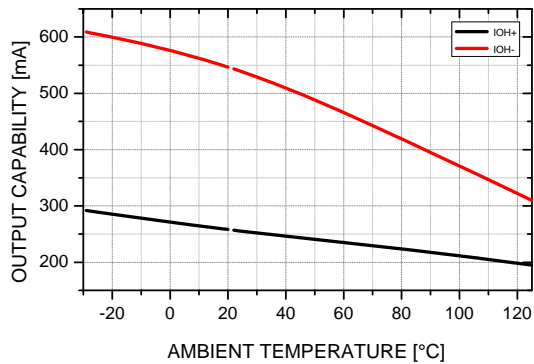


图 9. 输出灌电流 / 源电流与温度的关系

开关时间定义

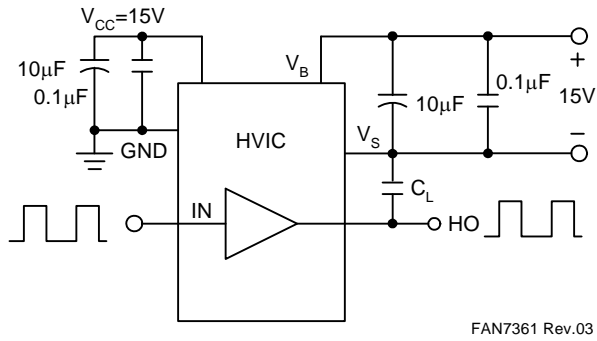


图 10. 开关时间测试电路

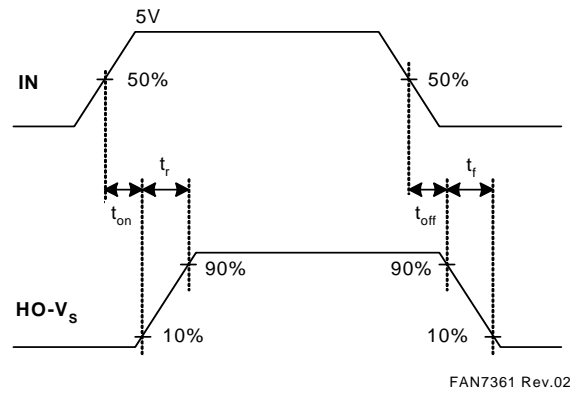


图 11. 输入 / 输出时序图

物理尺寸

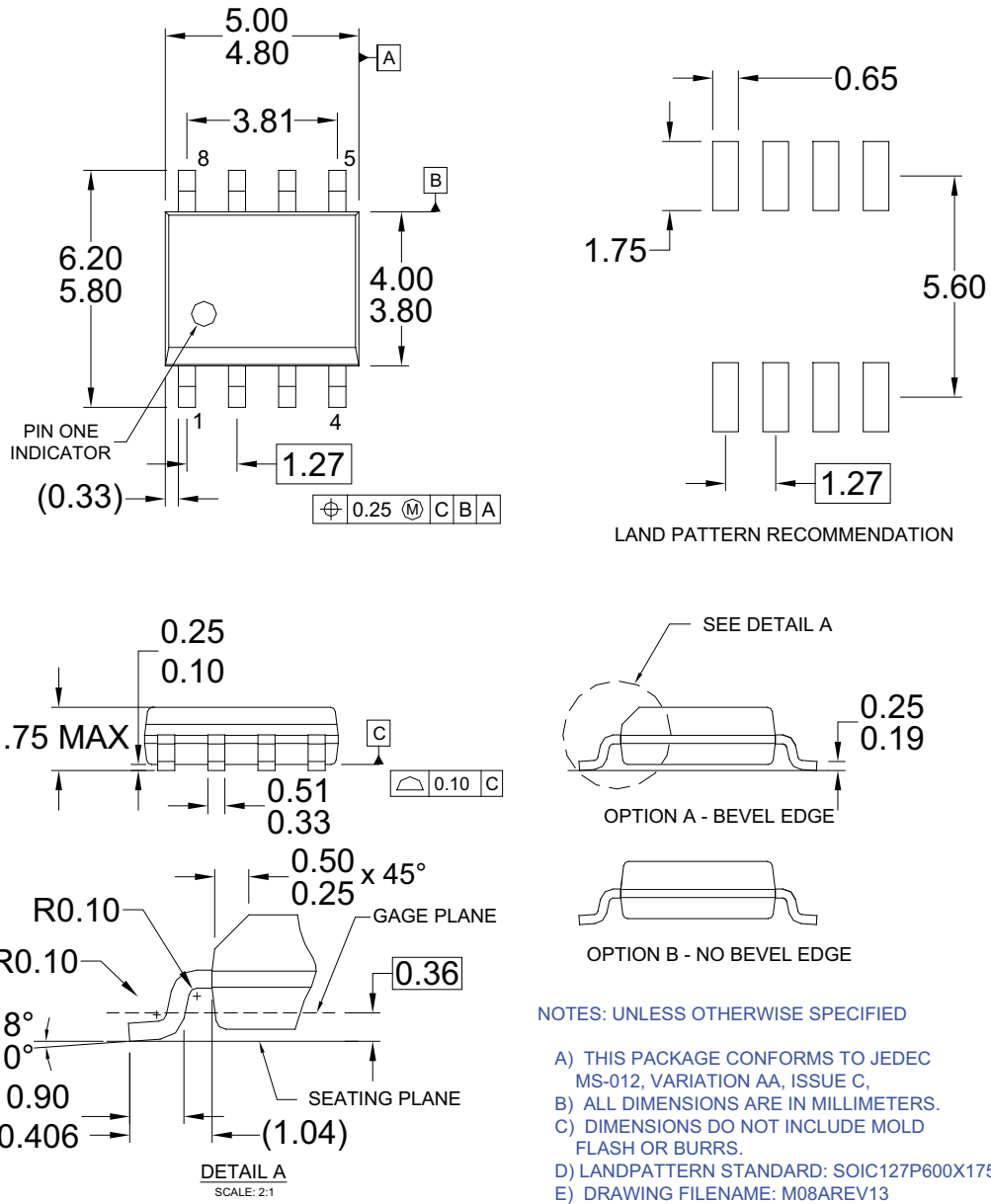


图 12. 8- 引脚小尺寸封装 (SOP)

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